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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/614,738

07/07/2003

Debasis Mitra

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EXAMINER

KASRAIAN, ALLAHYAR

ART UNIT

PAPER NUMBER

2619

MAIL DATE

DELIVERY MODE

10/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/614,738

Applicant(s)

MITRA ET AL.

Examiner

Allahyar Kasraian

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9, 13 and 16 is/are rejected.
7) ☒ Claim(s) 10-12, 14, 15 and 17-20 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 07 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 03/01/2004.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement submitted on March 1, 2004 has been considered by the Examiner and made of record in the application file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1-3, 21 and 22** are rejected under 35 U.S.C. 102(e) as being anticipated by **Devi (US patent Application Pub. # 2003/0147400 A1)**.

Consider **claims 1, 21 and 22**, Devi discloses an apparatus for traffic engineering for in a network-based communication system, the apparatus comprising:

a memory (FIG. 2 for memory 206, and lines 1-3 of par. 0021);

and at least one processor, coupled to the memory (FIG. 2 processor 204 and lines 1-3 of par. 0021);

Devi discloses the apparatus operative, a method, and a computer-readable medium including computer codes (FIG. 2 code 208 and par. 0023 and 0024) to perform the method, comprising:

to determine, in response to a request, whether any path of a plurality of predetermined paths meets at least one requirement corresponding to the request, wherein the plurality of predetermined paths are determined by substantially maximizing carried demand on a network using at least traffic demand estimates and network topology information and by performing routing for the substantially maximized carried demand (FIG.1 for nodes 102, links 104 and server 200 and lines par. 0014; FIG. 2 for Demands 212 and Topology Information 214 lines 10-13 of par. 0026 for demands and request; lines 2-3 of par. 0004, and par. 0005 for traffic demand estimation and network topology); and

if a given path meeting the at least one requirement is found, to attempt to create a connection utilizing the given path (lines 8-9 of par. 0005).

Consider **claim 2 as applied to claim 1 above**, Devi discloses the carried demand comprises a total amount of demand that can be carried in the network (lines 1-2 of par. 0026).

Consider **claim 3 as applied to claim 1 above**, Devi discloses the at least one requirement comprises a destination address and a bandwidth (FIG. 2

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for destination 218 of demands 212, lines 5-6 of par. 0026; link information 224 including assigned bandwidth and available bandwidth, lines 10-15 of par. 0027 and lines 1-3 of col. 0041).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 4 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Devi (US patent Application Pub. # 2003/0147400 A1)** in view of **Aukia et al. (US Patent # 6594268 B1)** (hereafter Aukia).

Consider **claim 4 as applied to claim 1 above**, Devi discloses the claimed invention except to explicitly point out determining the traffic demand estimates based at least in part on previously measured traffic demands or historical traffic demands; and determining network topology by using information from link-state routing.

In the same field of endeavor, Aukia discloses determining the traffic demand estimates based at least in part on previously measured traffic demands or historical traffic demands (FIG. 10 step 1003 and lines 46-51 of col. 21, "The initial values for the traffic rates may be predetermined through network simulations, heuristic methods, or previous or current values measured prior to network reconfiguration and/or re-routing calculation."); and

determining network topology by using information from link-state routing (FIG. 5 and lines 48-52 of col. 13).

Therefore, it could have been obvious to a person of ordinary skills in art at the time the invention was made to incorporate link-state routing to the network topology and pervious measured traffic to the traffic demand estimates for purpose of optimizing route selection in a communication network. The proper motivation is to use a collection of statistical data and routing information to optimize current or future packet routing.

Consider **claim 6 as applied to claim 1 above**, Devi discloses the claimed invention except the step of: refusing the connection request if there are

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no paths in the plurality of predetermined paths meeting the at least one requirement or when the connection utilizing the given path is unavailable.

In the same field of endeavor, Aukia discloses the step of: refusing the connection request if there are no paths in the plurality of predetermined paths meeting the at least one requirement or when the connection utilizing the given path is unavailable (lines 20-22 of col. 22, "Blocking occurs if any link in the route refuses to establish the connection due to insufficient resources to carry the connection on that link.").

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate blocking events consideration as taught by Aukia to the optimized path selection as disclosed by Devi for purpose of selecting links with sufficient resources in path selection. The proper motivation is to cut the links without having required defined characteristics.

6. **Claims 5, 13 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Devi (US patent Application Pub. # 2003/0147400 A1)** in view of **Szviatovszki et al. (US Patent # 6956821 B2)** (hereafter Szviatovszki).

Consider **claim 5 as applied to claim 1 above**, Devi discloses substantially maximizing the carried demand using at least the traffic demand estimates and the network topology (lines 2-4 of par. 0004);

performing routing for the substantially maximized carried demand, thereby determining a plurality of resultant paths (lines 7-9 of par. 0005);

However, Devi fails to disclose storing the plurality of resultant paths as the predetermined paths.

In the same field of endeavor, Szviovski discloses storing the plurality of resultant paths as the predetermined paths (FIG. 2 block 20, lines 23-28 of col. 4).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate the storing of calculated paths to a database as taught by Szviovski to the path calculation method as disclosed by Devi for purpose of saving the calculated paths as future reference. The proper motivation is to use the saved calculated paths from the database of a router for future estimation of the paths in a network.

Consider **claim 13 as applied to claim 5 above**, Devi as modified by Szviovski disclose the claimed invention, and in addition, Devi discloses the step of performing routing further comprises the step of performing routing for the substantially maximized carried demand, subject to a plurality of second constraints (FIG.3 with consideration of substantially maximized carried demand as optimization of network paths between nodes, par. 0031, 0032 and par. 0025, the second constraints as service classes or capacity link).

Consider **claim 16 as applied to claim 5 above**, Szviatovszki further discloses the step of performing routing further comprises the step of minimizing a total bandwidth-length product subject to a plurality of constraints including path-assignment constraints (lines 26-29, 33-39 and 46-50 of col. 9).

- 7: **Claims 7-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Devi (US patent Application Pub. # 2003/0147400 A1)** in view of **Szviatovszki et al. (US Patent # 6956821 B2)** (hereafter Szviatovszki).

Consider **claim 7 as applied to claim 1 above**, Devi discloses the network topology comprises nodes interconnected through edges (FIG. 1 for nodes 102 and edges 104 and par. 0014);

However, Devi, fails to disclose the request is made by a source node;
the method further comprises the steps of:

determining whether a designed load between the source node and a destination node is greater than a measured load between the source and destination nodes;

when the designed load between the source node and the destination node is greater than a measured load between the source node and the destination node, pruning edges that do not have a first available bandwidth from the network, thereby creating a first pruned network; and

when the designed load between the source and a destination is not greater than a measured load between the source and destination, pruning edges that do not have a second available bandwidth from the network, thereby creating a first pruned network.

In the same field of endeavor, Szviatovszki discloses the request is made by a source node (FIGS. 1 and 2, lines 11-14 of col. 5);

the method further comprises the steps of:

determining whether a designed load between the source node and a destination node is greater than a measured load between the source and destination nodes (lines 50-58 of col. 1 and lines 59-67 of col. 9 for Dijkstra CSPF algorithm for minimizing cost of the path);

when the designed load between the source node and the destination node is greater than a measured load between the source node and the destination node, pruning edges that do not have a first available bandwidth from the network, thereby creating a first pruned network (lines 59-67 of col. 9, "For this LSP path calculation, the traffic engineering path selection module 72 marks all links in its database 74 as "invalid" having an unreserved bandwidth at the priority level of the LSP setup priority that is less than the LSP's bandwidth requirement. This can be determined as a simple inequality comparison $B_{us} < B_{LPS}$. In other words, links are eliminated or "pruned" that do not have enough unreserved bandwidth to support the LSP with the given priority s."); and

when the designed load between the source and a destination is not greater than a measured load between the source and destination, pruning edges that do not have a second available bandwidth from the network, thereby creating a first pruned network (lines 59-67 of col. 9 and lines 29-38 of col. 10, "the maximum reservable bandwidth on the link B_{\max} ... an unreserved bandwidth vector $B_u = (B_{u0}, B_{u1}, \dots, B_{u7})$ containing the actual unreserved bandwidth values").

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate load balancing between source and destination node with consideration of available bandwidth as taught by Szviatovszki to the network management method as disclosed by Devi for purpose of choosing a path in order to balance the network load. The proper motivation is to select a path between nodes with consideration load balancing and available bandwidths.

Consider **claim 8 as applied to claim 7 above**, Szviatovszki further discloses the first bandwidth is zero and the second bandwidth is a predetermined trunk reservation (lines 49-56 of col. 10 and lines 1-5 of col. 11).

Consider **claim 9 as applied to claim 7 above**, Szviatovszki further discloses the steps of determining whether a designed load, pruning edges that do not have a first available bandwidth from the network, and pruning edges that

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do not have a second available bandwidth from the network are performed prior to the step of determining, in response to a request, whether any path of a plurality of paths meets at least one requirement; and the method further comprises performing, if a given path meeting the at least one requirement is not found, the following steps: pruning edges that do not have a first available bandwidth from the first pruned network to create a second pruned network; computing shortest path from the source node to the destination node in the second pruned network; and attempting to create a connection on the shortest path (lines 17-24 of col. 13).

8. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Szviatovszki et al. (US Patent # 6956821 B2)** in view of **Shabtay et al. (US Patent # 6895441 B1)** (hereafter Shabtay).

Consider **claim 23**, Szviatovszki discloses a method for traffic engineering for a network-based communication system comprising a network having nodes interconnected through edges, and wherein a source node requests a connection to a destination node, the method comprising the steps of (FIG. 1):

determining a first shortest path between the source node and destination node;

pruning edges not having a first available bandwidth from the network, thereby creating a first pruned network;

computing a second shortest path between the source node and the destination node using the first pruned network (Table 1 for 2nd method, and lines 14-26 of col. 13);

However, Szviatovszki fails to disclose if a length of the second shortest path is equivalent to a length of the first shortest path, attempting to create a connection on the second shortest path; and if a length of the second shortest path is not equivalent to a length of the first shortest path, performing the following steps: pruning edges not having a second available bandwidth from the first pruned network, thereby creating a second pruned network; computing a third shortest path between the source node and destination node using the second pruned network; and attempting to create a connection on the third shortest path.

In the same field of endeavor, Shabtay discloses if a length of the second shortest path is equivalent to a length of the first shortest path, attempting to create a connection on the second shortest path (lines 14-21 of col. 4 and lines 12-22 of col. 5, for the first path search with the required bandwidth); and

if a length of the second shortest path is not equivalent to a length of the first shortest path, performing the following steps (this condition could be interpreted as unsuccessful first search indicated in lines 18-19 of col. 5,):

pruning edges not having a second available bandwidth from the first pruned network, thereby creating a second pruned network;

computing a third shortest path between the source node and destination node using the second pruned network; and

attempting to create a connection on the third shortest path (lines 19-22 of col. 5 for the second search, the path chosen from protected paths and unprotected path are considered as the first pruned network and combined bandwidth is considered as the second available bandwidth).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate second bandwidth to prune the network as taught by Shabtay to one the path metrics disclosed by Szviatovszki for purpose of selecting best available links between different nodes in a network. The proper motivation is to choose the best available links between nodes in a network.

Allowable Subject Matter

9. **Claims 10, 11, 12, 14, 15, 17-20** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

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- a. Mao (U.S. Patent # 7168044 B1) discloses Apparatus and method for automatic network connection provisioning.
- b. Iovanna et al. (U.S. Patent Application Publication # 2006/0209785 A1) discloses Dynamic routing in packet-switching multi-layer communications networks.
- c. Oishi et al. (U.S. Patent # 7047311 B2) discloses Bandwidth management apparatus and method, program therefor and recording medium with the program recorded thereon
- d. Mo et al. (U.S. Patent # 7075927 B2) discloses Method and system for quality of service (QoS) support in a packet-switched network.

11. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Allahyar Kasraian whose telephone number is

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(571) 270-1772. The Examiner can normally be reached on Monday-Thursday from 8:00 a.m. to 5:00 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Allahyar Kasraian
A.K./ak

October 10, 2007


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER